The ALADIN consortium

P. Termonia

Organizational matter

- Members, unchanged: Al, Au, Be, Bu, Cz, Fr, Hr, Hu, Mo, Pl, Pt, Ro, Si, Sl, Tu, Tk

- Analysis of a further possibilities for convergence between HIRLAM and ALADIN at the governance level.

  - Current status:
    - Common science (common plan, common code, common meetings)
    - Disjoint governance systems
  - Common meeting between HIRLAM Advisory Council and ALADIN Policy Advisory Council.
  - Back-to-back council/ALADIN GA for 2014.

- Common HIRLAM ASM - ALADIN Workshop in Reykjavik

- Common newsletter (in progress)

- A New LACE Program Manager: Yong Wang (see talk later)

Scientific and technical points of attention

- Convection permitting EPS (Madrid workshop in June): ***can EPS systems be seen as tools for testing parameterizations?***

- Verification of high-resolution output: scores/cases, monitoring / validation of cycles / scientific toolbox (talk C. Zingerle)

- Radar DA activities (see talk M. Mile)

- Increase of resolution (towards 1 km and prototype testing of hectometric resolutions) (talks F. Bouyssel, N. Pristov)

- VFE dynamics (talk Petra Smolikova) and Horizontal finite elements and on a Z grid. New methods (talk of L. Auger).

Convection-permitting EPS (2.5 km resolution), SRNWP meeting Madrid in June

Pmsl mean of the period 20120610 - 20120617 initialized at 00 HH
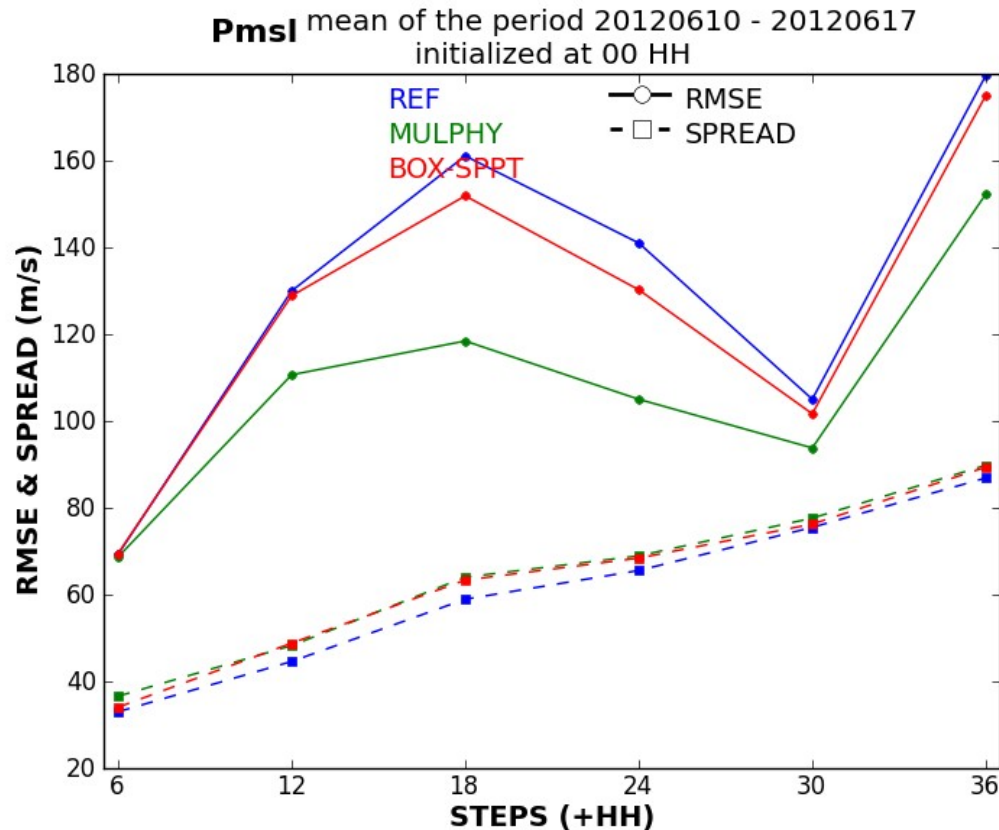
- A first protoype of a convection permitting EPS was tested.

- The first one was with AROME members only (red).

- Then it was extended with ALARO members (parameterized deep convection) (green line)

- The RMSE decreased, SPREAD stays the same
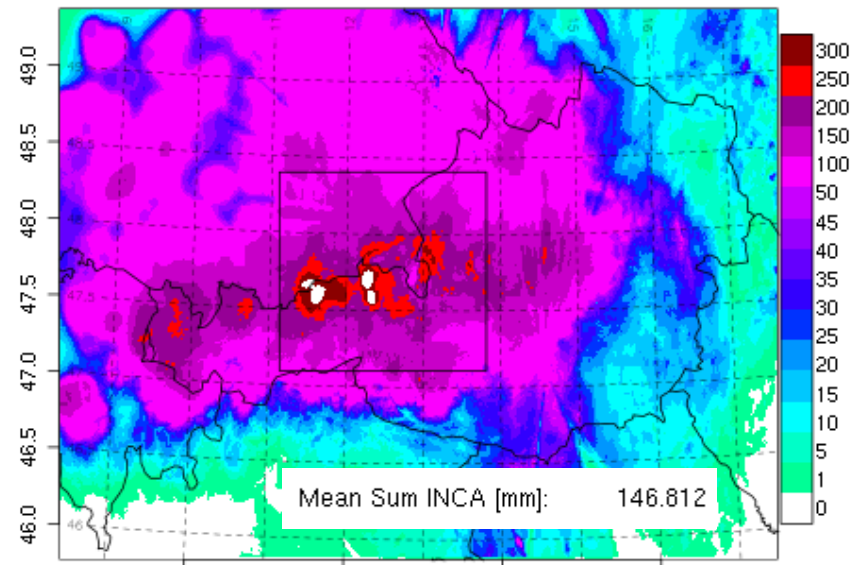
Courtesy Alfons Callado Pallarès

The 2013 Central European flooding

72h precip. INCA 2013060300

Mean Sum INCA [mm]: 146.812

72h precip. ECMWF 2013053100+72

Mean Sum Forecast [mm]: 120.720

72h precip. ALARO5 2013053100+72
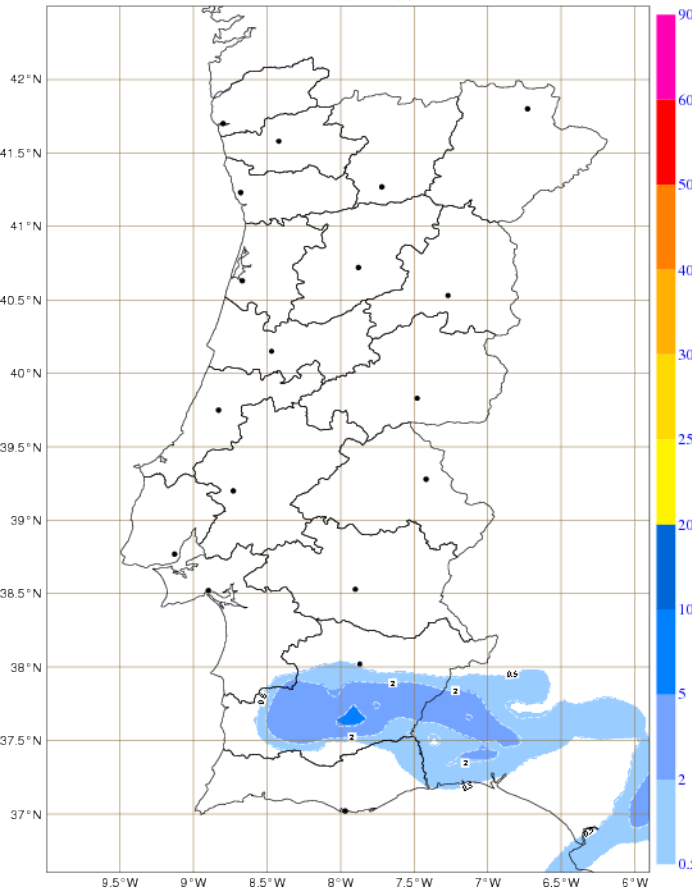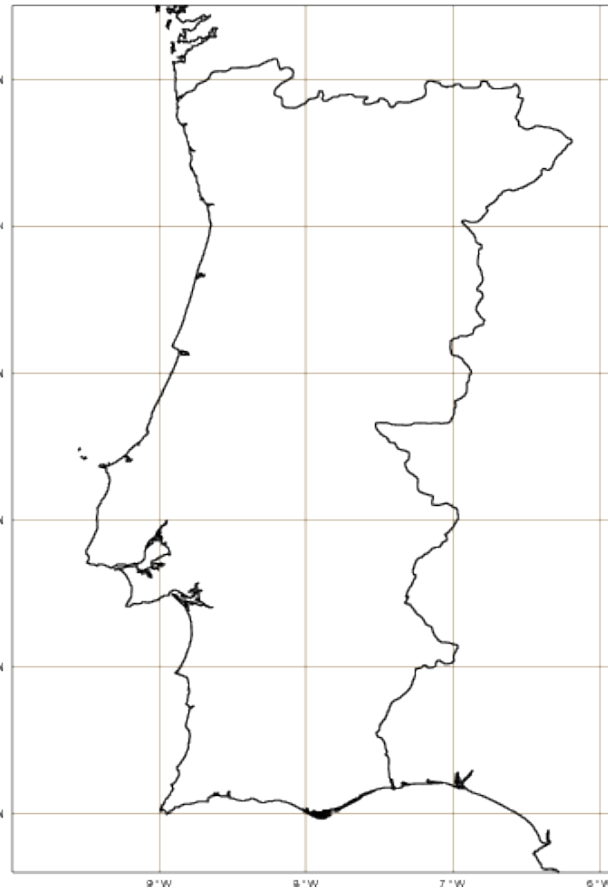
Mean Sum Forecast [mm]: 155.847
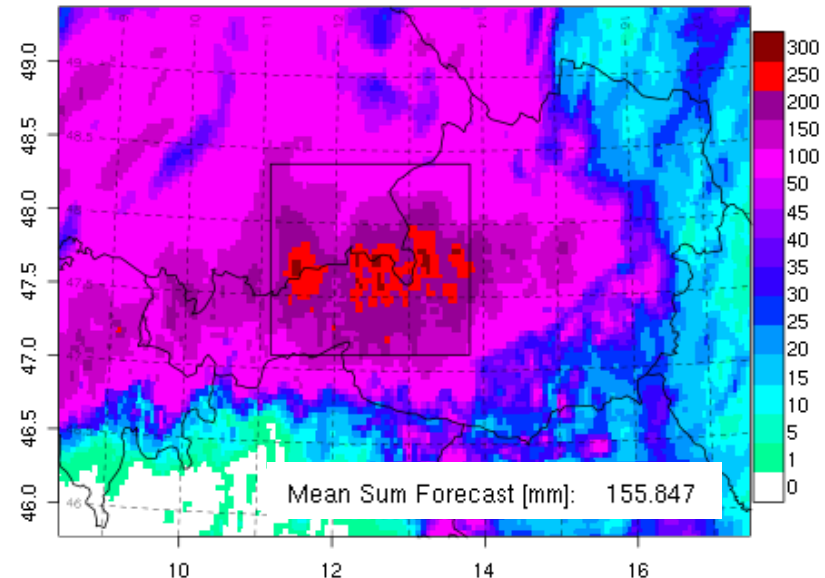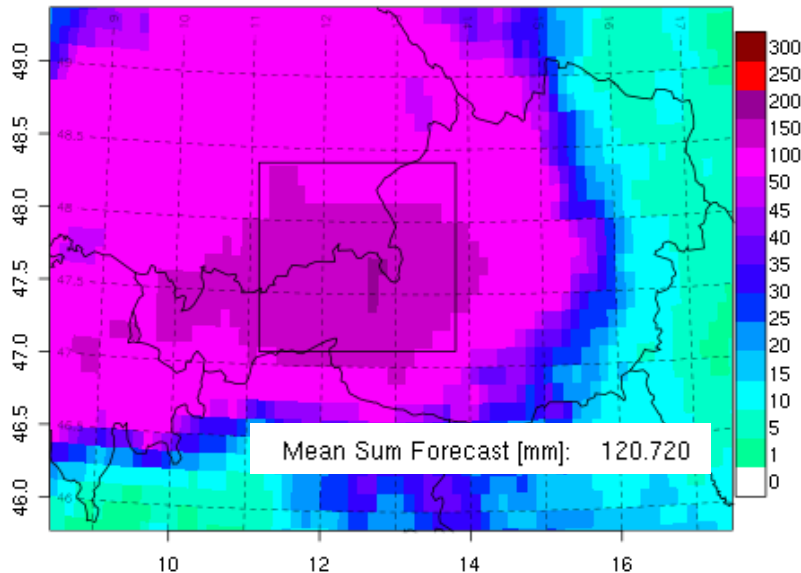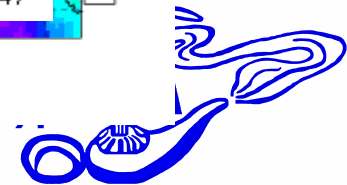
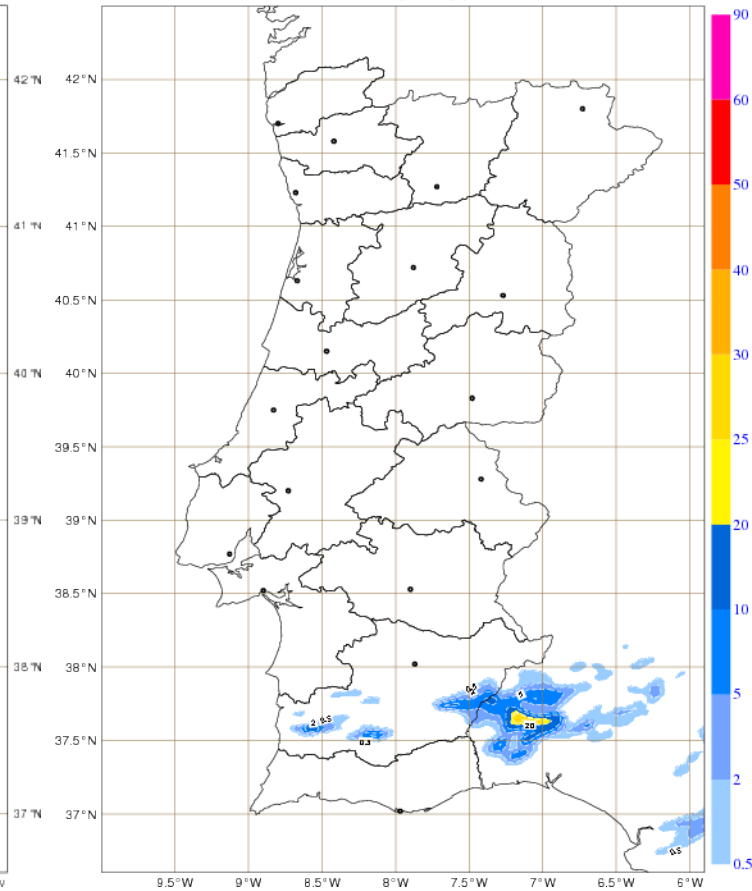ALADI

Case for Portugal, courtesy João Rio

ALADIN: Precipitação total (mm) acumulada em 3 horas
Sex 13 Set 13 00UTC Previsão H+(18-15) para Sex 13 Set 13 18UTC

ECMWF: Precipitação total (mm) acumulada em 3 horas
Sex 13 Set 13 00UTC Previsão H+18 para Sex 13 Set 13 18UTC

AROME: Precipitação total (mm) acumulada em 3 horas
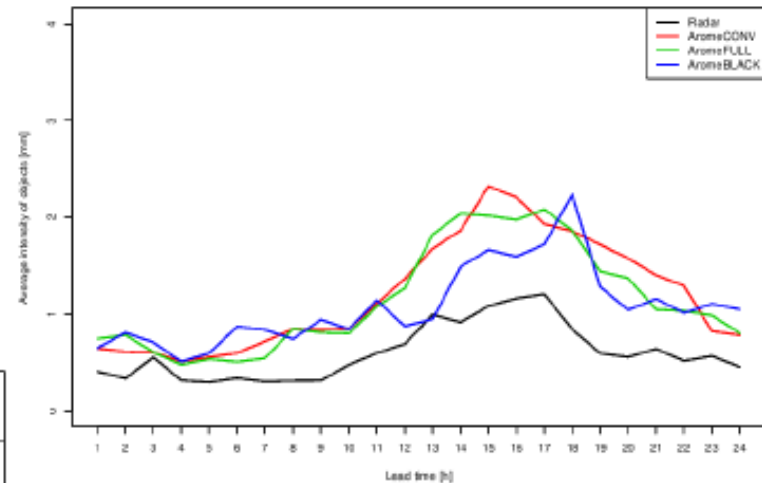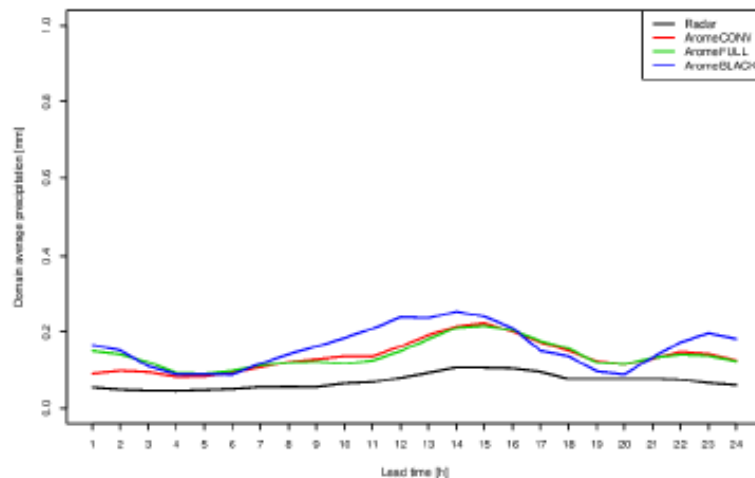Sex 13 Set 13 00UTC Previsão H+(18-15) para Sex 13 Set 13 18UTC

Radar DA in Hungary: AROME oper vs AROME RADAR

Radar feature-based verification:

Average intensity of the objects –
Better with blacklisting

Domain average precipitation –
Best with full RADAR

AROME CONV
AROME RADAR FULL
AROME RADAR BLACKLISTING
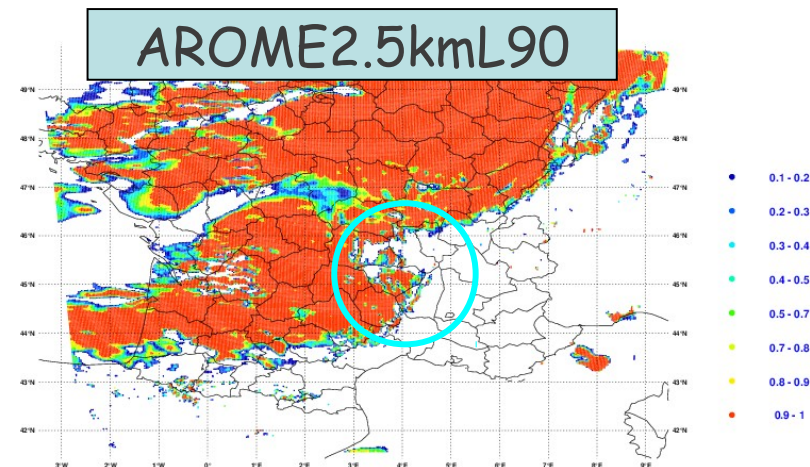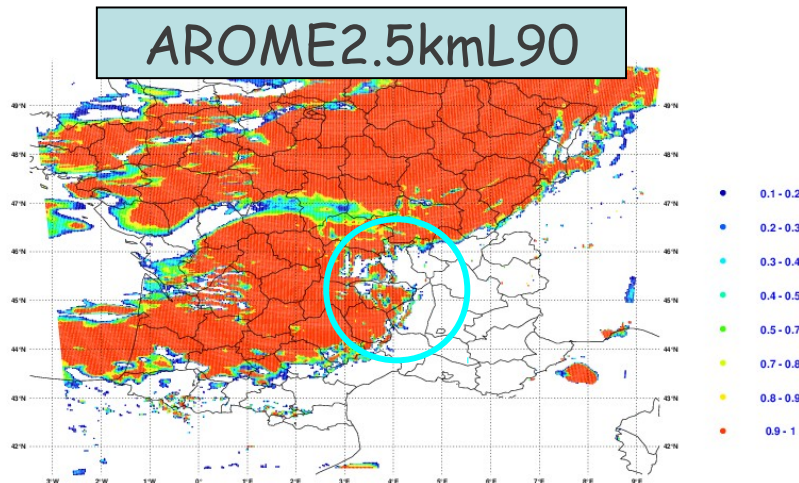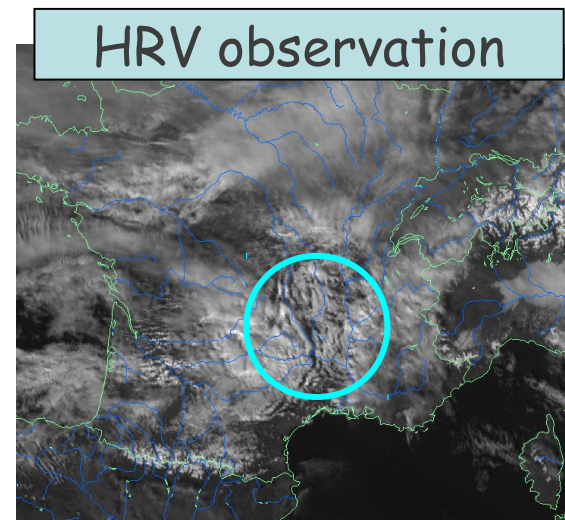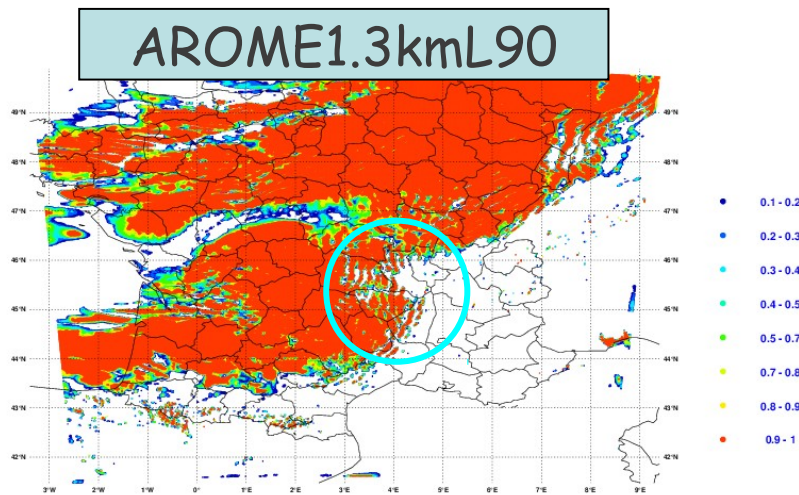
9. LACE DAWD Vienna

Courtesy Mate Mile

Increasing the resolution : Prototype AROME 1.3km

- Runs OK with dt=45s PC_CHEAP (NSITER=1), LGWADV
- Stronger NH impact at 1.3 km (orographic waves): 31st January 2013 +14TU

Courtesy Yann Seity

Replacing the spectral methods by Horizontal Finite elements on a Z-grid.

$$(\mathcal{I} - \frac{\Delta t}{2}\mathcal{L}^*)X_A^+ = (\mathcal{I} + \frac{\Delta t}{2}\mathcal{L}^*)X_D^0$$
$$+ \Delta t(\mathcal{M} - \mathcal{L}^*)\tilde{X} + \Delta t\mathcal{F}(X^0)$$
$$= R$$

	ALADIN timestep organization	
1	transform the fields from spectral space to gridpoint space	
2	calculate physics in a parallel manner in the arrival points	$\mathcal{F}(X_A^0)$
3	update tendencies	
4	compute SL departure points D and interpolate to D	
5	compute explicit part dynamics	$(\mathcal{I} + \frac{\Delta t}{2}\mathcal{L}^*)X_D^0 + \Delta t(\mathcal{M} - \mathcal{L}^*)\tilde{X}$
6	add all tendencies	R_{lam}
7	couple and relax the LAM fields to the host model	$R_{tot} = \alpha R_{lam} + (1-\alpha)R_{host}$
8	transform the fields from gridpoint space to spectral space	
9	solve Helmholtz problem	$X_A^+ = (\mathcal{I} - \frac{\Delta t}{2}\mathcal{L}^*)^{-1}R_{tot}$

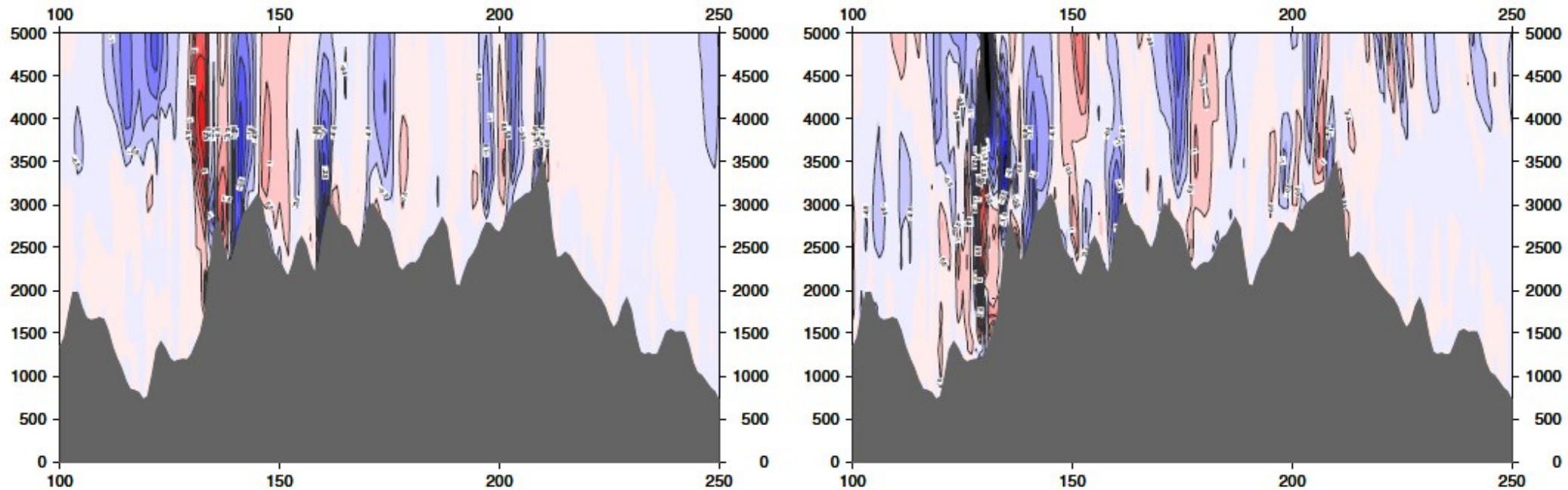*Caluwaerts, Degrauwe, Termonia, Voitus, Bénard, Geleyn*
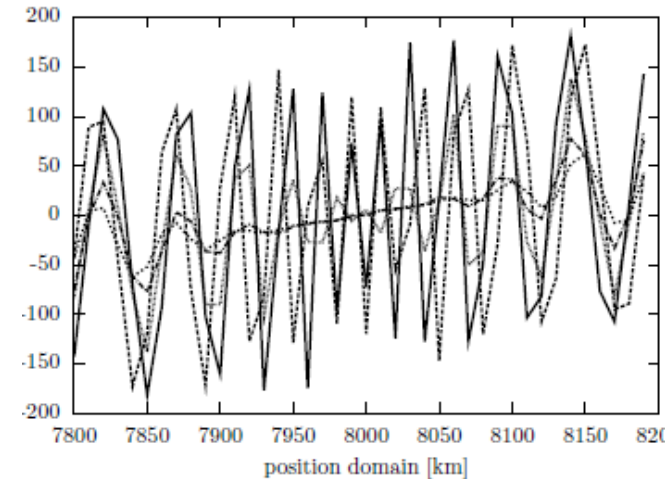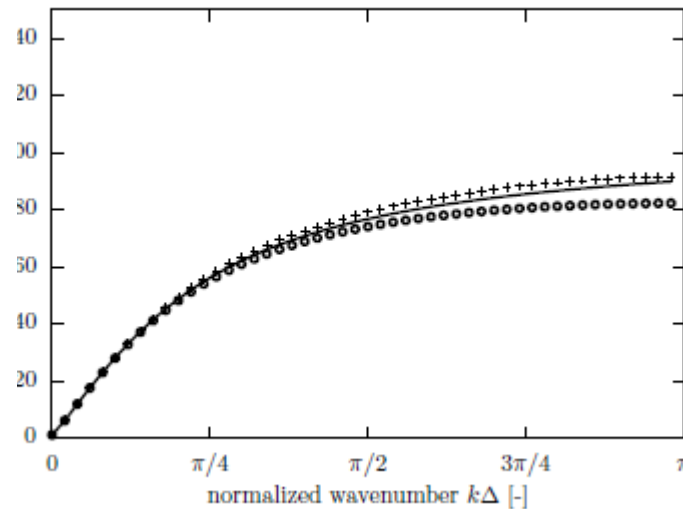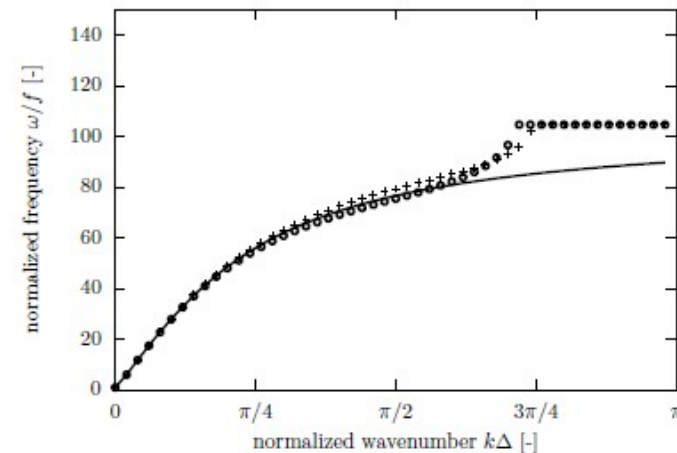
NH Vertical Finite Elements

Cross section through the middle of the domain (from west to east)

+24h, $w[ms^{-1}]$, $dt = 30s$

+24h, $w[ms^{-1}]$, $dt = 90s$

Tests are stable, next: test accuracy

P. Smolikova, J. Vivoda

Possible questions for this week:

- Convection permitting EPS

- Dynamical cores

- OPERA?